REMARKS

This paper accompanies a request for continued examination pursuant to 37 CFR §1.114. The pending appeal is hereby withdrawn.

The support for the amendments in independent claim 26 is found in various parts of the written description. In particular, the former "case frame" is now described as a "machine-readable symbolic representation" as described, for example, at [0026] and [0071]. The concept of "constraint information" being part of the machine-readable symbolic representation is described, for example, in the discussion at [0026] concerning "an epistemological relationship" between node pairs; the statement in [0009] that the knowledge base (created by the machine-readable symbolic representations) is "ontologically consistent" provides further support for this claim element, as the "constraint information" is, in part, what provides this consistency. Moreover, the written description includes numerous examples of constraint information in describing the machine-readable symbolic representations. Thus, paragraph [0071] describes an "X catalyzedBy Y" symbolic representation 722 (see page 20) that is defined by "reactions of type X are catalyzed by enzyme molecules of type Y." (See, also the Table at page 31) The constraint information in this example is that X has to be a reaction and Y has to be an enzyme molecule; if X is a protein (and Y an enzyme molecule), for example, the constraint information is violated and the information cannot be encoded into the machine-readable symbolic representation. As this example illustrates, the constraint information is implicit in the symbolic representation but ensures that the data encoded into the symbolic representation confirms to an "epistemological relationship" that enforces the life science ontology.

The amended claim 26 also recites that the life science knowledge encoded into the machine-readable symbolic representation "is semantically rigorous and based on the life sciences ontology." Support for this wording is found in '[0052], which refers to "a representational formalism," and such a "formalism" means that a semantic rigor is applied to the data; an example of one such formalized representation is the case frame 602 as described in [0061] on page 17 of the specification.

The graphical user interface elements in amended claim 26 are found, for example, at [0103-0104, concerning the addition of new data for the symbolic representation] and at [0106], concerning the "restricting" limitation].

As the Examiner will also appreciate, various amendments have been made to dependent claims 27, 29, 31, 33-35, 38, 40, 92-95, 97-99, and 102-104 either to conform the language to the changes to the parent claim 26 (or new independent claim 112), or to improve the wording. What was independent claim 101 is now dependent on new independent claim 11.

New dependent claims 107-111 describe additional subject matter that has not been previously claimed. Support for the subject matter in claim 107 is found, for example, in [0061]. Support for the subject matter in claim 108 is found, for example, in [0053] and [0116]. Support for the subject matter in claims 109-110 is found, for example, in [0119]. Support for the subject matter in claim 111 is found, for example, in [0105].

New independent claim 112 has been written to describe a data processing system that includes a processor, computer memory that stores a knowledge base [0009], and an inference engine [0125] that is executed against the knowledge based stored in the computer memory. As described throughout the specification, the knowledge base comprises a set of biological assertions, wherein a biological assertion is formalized in a machine-readable symbolic representation that comprises at least two object identifiers, a relationship connector that relates at least two the object identifiers to each other based on a casual relationship, and constraint information that defines which of a set of connections among the object identifiers are permitted. The inference engine is executed by the processor against the knowledge base stored in the computer memory (i) to infer a new casual relationship that is permitted by the constraint information and (ii) to automatically instantiate the new casual relationship into a machine-readable symbolic representation as a new biological assertion that is then added to the knowledge base [0125-0126].

No new matter has been included.

The pending claim rejections are now moot in view of the amendments

As the claims currently stand (i.e., before the amendments herein), claims 26-39, 92-95 and 97-106 were rejected as anticipated by Kim et al, U.S. Publication No. 2002/0087275. In addition, claims 40, 96 and 99-100 were rejected as obvious over Kim in view of Stanley et al, U.S. Publication No. 2002/0198858.

Reconsideration is now requested, for the reasons set forth herein.

Alleged anticipation

Kim describes a method for representing molecular biological relationships using graphical tools [0035]. According to the Examiner (see "Examiner's Answer" filed September 18, 2008)), the Kim publication includes an electronic database storage module for storing a library of case frames, wherein each case frame has at least two unspecified object identifiers, and a relationship connector, and wherein the relationship connector relates two of the object identifiers to each other based on a causal relationship and based on a life science ontology, citing [0046]-[0047], [0055] and [0057], together with Kim Figure 1. In particular, and as the "Response to Arguments" at pages 10-14 of that paper contend, Kim's teaching of a system for visualization and storing of biomolecular relationship data using a graph-based approach (e.g., Figure 1) is the same as the claimed "case frame." In particular, the Examiner reads "object identifiers" to encompass the Kim graph "vertices" and the "relationship connector" to encompass the Kim graph "edges" (or "edge directions and weights")

With respect, the Applicants maintain their prior contentions that Kim does not disclose the inventive case frame architecture; nevertheless, to advance this prosecution the undersigned (new counsel of record) has amended claim 26.

As now described, the former "case frame" is now recited as being a "machine-readable symbolic representation" that includes "constraint information" that defines which connections among the object identifiers are permitted so that life sciences knowledge encoded into the machine-readable symbolic representation is semantically rigorous and based on the life sciences ontology. In contrast, the Kim "graph" is merely a visual construct as opposed to being a machine-readable symbolic representation. Moreover,

while Kim does enable the edges in the graph to be characterized (see Kim [0097]-[0098]), these characterizations do not impose constraints that define "which connections among the object identifiers are permitted" (and by implication, which are not).

Further, while Kim teaches visualization of the graph structures, amended claim 26 goes much further in reciting the functions of the graphical user interface in the subject application. As amended, the claimed interface (i) receives an input selecting one of the machine-readable symbolic representations as a template to represent new data, (ii) restricts input of any data element that does not conform to the constraint information associated with the selected machine-readable symbolic representation such that the semantically rigorous relationships for the life sciences ontology are maintained, and (iii) receives input of at least one data element that conforms to the constraint information to instantiate the machine-readable symbolic representation. This subject matter is absent from Kim.

To establish anticipation, every element and limitation of the claimed invention must be found in a single prior art reference, arranged as in the claim. *Karsten Mfg. Corp. v. Cleveland Golf Co.*, 242 F.3d 1376, 1383 (Fed. Cir. 2001); *Net MoneyIn, Inc. v. Verisign, Inc.*, 545 F.3d 1359, 1369 (Fed.Cir. 2008) ("unless a reference discloses within the four corners of the document not only all of the limitations claimed but also all of the limitations arranged or combined in the same way as recited in the claim, it cannot be said to prove prior invention of the thing claimed").

The claimed subject matter must be disclosed "clearly and unequivocally" in the reference. *In re Arkley*, 455 F.2d 586, 587 (CCPA 1972). Moreover, anticipation is not established if, in reading a claim on something disclosed in a reference, it is necessary to pick, choose and combine various portions of the disclosure, which according to the teachings of the reference, are not directly related to each other. *Id.*, 455 F.2d at 587-88.

The prior art reference must describe every limitation in a claim either explicitly or inherently. *In re Schreiber*, 128 F.3d 1473, 1477 (Fed.Cir. 1997). Inherent anticipation, however, cannot be based on possibilities or probabilities. *Akamai Tech., Inc. v. Cable & Wireless Internet Serv., Inc.*, 344 F.3d 1186, 1192 (Fed. Cir. 2003) ("A claim limitation is inherent in the prior art only if it is necessarily present in the prior art, not merely probably

or possibly present."); *In re Robertson*, 169 F.3d 743, 745 (Fed. Cir. 1999) ("Inherent anticipation requires that the missing descriptive material is 'necessarily present,' not merely probably or possibly present, in the prior art").

Further, to be anticipatory, the reference must "enable one of ordinary skill in the art to make the invention without undue experimentation." *Impax Labs., Inc. v. Aventis Pharms. Inc.*, 545 F.3d 1312, 1314 (Fed. Cir. 2008); *see In re Paulson*, 30 F.3d 1475, 1478-1479 (Fed.Cir. 1994); *In re LeGrice*, 301 F.2d 929, 940-44 (CCPA 1962).

An anticipation rejection cannot be predicted on an ambiguous reference. Rather, disclosures in a reference relied on to prove anticipation must be so clear and explicit that those skilled in the art will have no difficulty in ascertaining their meaning. *In re Turlay*, 304 F.2d 893, 899 (CCPA 1962).

Because Kim does not disclose either a machine-readable symbolic representation including constraint information or the specific functions of the graphical user interface as now positively recited, the reference does not anticipate amended claim 26. "Absence from the reference of any claimed element negates anticipation." *Kloster Speedsteel AB v. Crucible, Inc.*, 793 F.2d 1565, 1571 (Fed.Cir.1986).

Kim likewise does not anticipate the subject matter of new independent claim 112, which also describes the machine-readable symbolic representation that includes "constraint information." With respect to new independent claim 112, Kim also does not disclose an "inference engine" that is executed against a knowledge base to provide specific functions, namely: (i) to infer a new casual relationship that is permitted by the constraint information and (ii) to automatically instantiate the new casual relationship into a machine-readable symbolic representation as a new biological assertion that is then added to the knowledge base.

Kim's system, as noted above, merely displays graphical representations of biological data.

Dependent claims 27, 29, 31, 33, 33-35, 38, 40, 92-95, 97-99, 101-104, 107-111 and 113-116 are not anticipated for at least the same reasons as applied with respect to independent claims 26 and 112. As noted, anticipation requires exact correspondence

between the claim and the cited reference, and Kim does not meet this rigorous requirement with respect to the claims presented herein.

Alleged obviousness

The current obviousness rejection is easily addressed. Stanley describes a software architecture that represents data records using "intelligent molecular objects" that provide a means for querying heterogeneous data sets using a common interface. Stanley does not contemplate using machine-readable symbolic representations and a life science ontology to govern the introduction of new data into a biological knowledge base. It is cited merely for its teachings of an "access manager layer to restrict access" to a database, as well as receiving data in an XML formats. Even if Stanley does describe such subject matter, the issue of alleged obviousness must be re-evaluated in view of the subject matter "as a whole" that is now positively recited in claims 26 and 112. The Stanley reference does not make up for the deficiencies in Kim, the primary reference, with respect to the claims as now amended or presented.

In reviewing the new claims presented herein, the Examiner is reminded that "every limitation positively recited in a claim must be given effect in order to determine what subject matter that claim defines." *In re Wilder*, 429 F.2d 447, 450 (CCPA 1970); *See also In re Wilson*, 424 F. 2d 1382, 1385 (CCPA 1970) ("[a]ll words in a claim must be considered in judging the patentability of that claim against the prior art."). The art of record does not disclose or render object the claimed subject matter of either claims 26 or 113; thus, reconsideration and favorable action are requested.

REQUEST FOR INTERVIEW

The undersigned believes that a telephone or personal interview with the Examiner will facilitate the Examiner's review of these amendments. Thus, a Form PTOL-413A accompanies this submission. The undersigned will contact the Examiner to arrange for an interview date and time once the RCE submission is entered.

FEES

The RCE fee has been charged to the undersigned's Deposit Account 50-4001. If any additional fees are due, the Office is requested to charge that account.

Accordingly, reconsideration is requested, as is a Notice of Allowance.

Respectfully submitted,

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